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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/526,689

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Yong-Ho Yang

8054-92 (LW8052PC/US)

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT

PAPER NUMBER

2883

MAIL DATE

DELIVERY MODE

11/24/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/526,689	Applicant(s) YANG ET AL.	
	Examiner ANDREW SCHECHTER	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 4, 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4 September 2009 have been fully considered but they are not persuasive. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues [p. 5] that none of the cited references discloses the configuration of the gate electrode being on top of a channel layer, and specifically refers to *Shirhashi* disclosing its gate electrode being formed below a channel layer. This is not persuasive. First, *Shirhashi* does disclose having a gate electrode being formed below a channel layer [see Fig. 3, for instance], but it also appears to give explicit fruition to the alternative arrangement where the gate electrode is formed on a channel layer [see col. 13, line 67 – col. 14, line 5, for instance]. Second, and more importantly, gate-on-bottom and gate-on-top arrangements of the TFTs are generally considered art-recognized equivalents as clearly evidenced by *Tsujimura et al.* below, so the amendment to claim 1 does not patentably distinguish the claims over the prior art. The previous rejections are therefore maintained, modified as necessary by the amendment to the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Park et al.*, US 2002/0113931 in view of *Ohgawara et al.*, U.S. Patent No.

5,617,230 and further in view of *Tsujimura et al.*, US 2002/0003587.

Park discloses [see Fig. 1a, for instance] a liquid crystal display device comprising: a first substrate [10], a second substrate [20] being opposite to the first substrate; color filters [22] formed on the second substrate; and a liquid crystal layer [30] disposed between the substrates. *Park* discloses a normally black arrangement with TFT [11] (a first thin film transistor formed on the first substrate) supplying a voltage to the pixel electrode [12], so that an electric field is generated between it and the common electrode [23] on the opposite substrate, with the polarizers [14 and 24] aligned so that the pixel becomes dark (light does not pass through) when the electric field is zero [see paragraphs 0034 and 0051, for instance]. *Park* does not disclose the limitations related to the border of the display.

Ohgawara discloses [see Fig. 2, for instance] an analogous liquid crystal display device comprising: a first substrate and a second substrate opposed to the first substrate [see abstract, for instance], a first color filter [17] formed on a first portion [15] of the second substrate, the first portion corresponding to a first area of a display area, the first area being a border area of the display area [see Fig. 2], a second color filter [13] formed on a second portion [11] of the second substrate, the second portion corresponding to a second area of the display area, the second area being the display

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area except the border area; a first liquid crystal layer [see abstract] disposed between the first and second substrates in the first area, and a second liquid crystal layer disposed between the first and second substrates in the second area [see col. 7, line 43—col. 8, lines 15, for instance; note that these are just different portions of the same liquid crystal layer, as in the present specification]. *Ohgawara* also discloses that a voltage is applied in such a manner so as to maintain the peripheral pixels in a light-shielded state [see col. 7, line 43 - col. 8, line 15, for instance], which *Ohgawara* explains can be either a "selective voltage" or a "non-selective voltage" depending on the type of LCD being used. In plainer language, the appropriate voltage is applied to create a dark-state pixel, or to have the liquid crystal in that pixel region act as a closed shutter to prevent light from passing through to the viewer. In the case of *Park*, which is a normally black device, in order to produce the desired light-shielded state, a zero electric field would be formed on the first liquid crystal layer [by applying 0 volts].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the border arrangement of *Ohgawara* in the device of *Park*, motivated by *Ohgawara's* teaching that this renders the display easier to be seen [see abstract]. In the device of *Park* in view of *Ohgawara*, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the pixel electrodes and TFTs in both the display areas and the border areas, so as to be able to produce a display image and also provide the peripheral light-shielding state taught by *Ohgawara* using *Park's* driving circuitry arrangement, without requiring additional dedicated circuitry. Thus, there would be a first pixel electrode disposed in the first area, a thin film

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transistor which controls a voltage of the first pixel electrode, and a gate electrode of the thin film transistor is connected to ground so that a data line is electrically disconnected from the first pixel electrode [the examiner takes official notice that it was well-known in the art for gate lines to be connected to the ground potential when the TFTs are being turned off; so, after 0 volts is applied to the pixel electrode via the data line while the TFT is turned on, the gate lines would be connected to ground to turn the TFTs off, meeting the claim limitation when interpreted in the broad sense discussed above].

The device of *Park* in view of *Ohgawara* does not have the gate electrode formed on top of a channel layer, as amended on 4 September 2009. Both references appear to be silent on whether the gate electrode is on top of the channel [a gate-on-top TFT] or below the channel [a gate-on-bottom TFT]. *Tsujimura* discloses an analogous liquid crystal display device, shows that either a gate-on-top TFT [see Figs. 1 and 2, for instance] or a gate-on-bottom TFT [see Figs. 3 and 4, for instance] can be used as the TFT in such LCDs, and clearly evidences that these two configurations are art-recognized equivalents. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the gate electrode in the above device formed on top of a channel layer, motivated by this arrangement being conventional which provides advantages in terms of ease-of-manufacturing, reliability, and known performance properties.

Claim 1 is therefore unpatentable.

The zero electric field is formed by nullifying an electric potential difference in the first liquid crystal layer [by applying 0 volts], so claim 2 is also unpatentable. There is a

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common electrode formed on the first and second color filter, wherein the first pixel electrode is arranged in a matrix shape [understood to mean that there are other pixel electrodes which together with the first pixel electrode form a matrix] and the zero electric field is formed by nullifying an electric potential difference between the common electrode and the first pixel electrode [so there is a 0 volt difference across the liquid crystal layer], so claim 3 is also unpatentable. The zero electric field is formed by forming an electrode layer on one of the first and second substrates, the electrode layer making contact with the first liquid crystal layer [see Fig. 1 of *Park*], so claim 5 is also unpatentable. The thickness (width) of the first color filter is no less than a thickness (width) of a pixel unit (region) [see Fig. 2 of *Ohgawara*], so claim 6 is also unpatentable.

4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Park et al.*, US 2002/0113931 in view of *Ohgawara et al.*, U.S. Patent No. 5,617,230 in view of *Tsujimura et al.*, US 2002/0003587 as applied above, and further in view of *Takao et al.*, U.S. Patent No. 5,101,289.

Ohgawara discloses [see Fig. 2] that the first color filter comprises three layers [red, green, and blue, for instance], but does not necessarily disclose that each of the three layers has a different thickness from each other.

Takao discloses [see Fig. 3] an analogous LCD having three color filter layers [R, G, and B], each of which has a different thickness from the others. It would have been obvious to one of ordinary skill in the art to do so in the above device, motivated by *Takao's* teaching that the different thicknesses enable the device to obtain desired spectral characteristics [col. 5, lines 42-45], meaning for instance that the hues of the

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colors can be adjusted to improve the coloration and the quality of the display. Claim 7 is therefore unpatentable.

The limitation of claim 8, that a thickness of the first color filter is regulated by controlling a coating thickness in a process in which the first color filter is coated on the second substrate or by a slit exposure process, is a product-by-process limitation which does not structurally distinguish the claimed device from that of the prior art [see MPEP 2113]. Claim 8 is therefore unpatentable.

5. Claims 1-3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Park et al.*, US 2002/0113931 in view of *Ohgawara et al.*, U.S. Patent No. 5,617,230 in view of *Tsujimura et al.*, US 2002/0003587, and further in view of *Shirahashi et al.*, U.S. Patent No. 5,285,301.

Park discloses [see Fig. 1a, for instance] a liquid crystal display device comprising: a first substrate [10], a second substrate [20] being opposite to the first substrate; color filters [22] formed on the second substrate; and a liquid crystal layer [30] disposed between the substrates. *Park* discloses a normally black arrangement with TFT [11] (a first thin film transistor formed on the first substrate) supplying a voltage to the pixel electrode [12], so that an electric field is generated between it and the common electrode [23] on the opposite substrate, with the polarizers [14 and 24] aligned so that the pixel becomes dark (light does not pass through) when the electric field is zero [see paragraphs 0034 and 0051, for instance]. *Park* does not disclose the limitations related to the border of the display.

Ohgawara discloses [see Fig. 2, for instance] an analogous liquid crystal display device comprising: a first substrate and a second substrate opposed to the first substrate [see abstract, for instance], a first color filter [17] formed on a first portion [15] of the second substrate, the first portion corresponding to a first area of a display area, the first area being a border area of the display area [see Fig. 2], a second color filter [13] formed on a second portion [11] of the second substrate, the second portion corresponding to a second area of the display area, the second area being the display area except the border area; a first liquid crystal layer [see abstract] disposed between the first and second substrates in the first area, and a second liquid crystal layer disposed between the first and second substrates in the second area [see col. 7, line 43—col. 8, lines 15, for instance; note that these are just different portions of the same liquid crystal layer, as in the present specification]. *Ohgawara* also discloses that a voltage is applied in such a manner so as to maintain the peripheral pixels in a light-shielded state [see col. 7, line 43 - col. 8, line 15, for instance], which *Ohgawara* explains can be either a "selective voltage" or a "non-selective voltage" depending on the type of LCD being used. In plainer language, the appropriate voltage is applied to create a dark-state pixel, or to have the liquid crystal in that pixel region act as a closed shutter to prevent light from passing through to the viewer. In the case of *Park*, which is a normally black device, in order to produce the desired light-shielded state, a zero electric field would be formed on the first liquid crystal layer [by applying 0 volts].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the border arrangement of *Ohgawara* in the device of *Park*, motivated

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by *Ohgawara's* teaching that this renders the display easier to be seen [see abstract].

In the device of *Park* in view of *Ohgawara*, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the pixel electrodes and TFTs in both the display areas and the border areas, so as to be able to produce a display image and also provide the peripheral light-shielding state taught by *Ohgawara* using *Park's* driving circuitry arrangement, without requiring additional dedicated circuitry [as seen in Fig. 15 of *Shirhashi*, where the circuitry in the dummy peripheral region matches that in the display area]. Thus, there would be a first pixel electrode disposed in the first area, a thin film transistor which controls a voltage of the first pixel electrode [or is at least connected to it; the word “controls” is a little odd when using the narrower interpretation of the claim language, as discussed previously], and a gate electrode of the thin film transistor.

Following the narrower interpretation of “connected to ground so that a data line is electrically disconnected from the first pixel electrode” discussed above, where this requires more than just setting the voltage on the existing gate line to ground, *Park* in view of *Ohgawara* does not explicitly disclose this narrowly interpreted limitation.

However, *Shirhashi* discloses [see Fig. 15], an analogous device with a dummy peripheral region analogous to that in *Ohgawara*, and teaches connecting the gate electrode of the TFT to ground [via the DGL and DGTM] so that a data line [DL] is electrically disconnected from the first pixel electrode [DITO1 in *Shirhashi*]. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by *Shirhashi's* teaching that this arrangement reliably provides the desired

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voltages to the peripheral pixel electrodes, without interfering with the video signals being applied to the display region [see col. 13, lines 27-61, for instance].

The device of *Park* in view of *Ohgawara* does not have the gate electrode formed on top of a channel layer, as amended on 4 September 2009. Both references appear to be silent on whether the gate electrode is on top of the channel [a gate-on-top TFT] or below the channel [a gate-on-bottom TFT]. (The examiner notes that *Shirahashi* appears to give explicit fruition to an arrangement where the gate electrode is formed on top of a channel layer, see col. 13, line 67 – col. 14, line 5; *Tsujimura* is relied upon in these rejections because its disclosure is more clear.) *Tsujimura* discloses an analogous liquid crystal display device, shows that either a gate-on-top TFT [see Figs. 1 and 2, for instance] or a gate-on-bottom TFT [see Figs. 3 and 4, for instance] can be used as the TFT in such LCDs, and evidences that these two configurations are art-recognized equivalents. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the gate electrode in the above device formed on top of a channel layer, motivated by this arrangement being conventional which provides advantages in terms of ease-of-manufacturing, reliability, and known performance properties.

Claim 1 is therefore unpatentable.

The zero electric field is formed by nullifying an electric potential difference in the first liquid crystal layer [by applying 0 volts], so claim 2 is also unpatentable. There is a common electrode formed on the first and second color filter, wherein the first pixel electrode is arranged in a matrix shape [understood to mean that there are other pixel

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electrodes which together with the first pixel electrode form a matrix] and the zero electric field is formed by nullifying an electric potential difference between the common electrode and the first pixel electrode [so there is a 0 volt difference across the liquid crystal layer], so claim 3 is also unpatentable. The zero electric field is formed by forming an electrode layer on one of the first and second substrates, the electrode layer making contact with the first liquid crystal layer [see Fig. 1 of *Park*], so claim 5 is also unpatentable. The thickness (width) of the first color filter is no less than a thickness (width) of a pixel unit (region) [see Fig. 2 of *Ohgawara*], so claim 6 is also unpatentable.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Park et al.*, US 2002/0113931 in view of *Ohgawara et al.*, U.S. Patent No. 5,617,230, *Tsujimura et al.*, US 2002/0003587, and *Shirahashi et al.*, U.S. Patent No. 5,285,301 as applied above, and further in view of *Takao et al.*, U.S. Patent No. 5,101,289.

Ohgawara discloses [see Fig. 2] that the first color filter comprises three layers [red, green, and blue, for instance], but does not necessarily disclose that each of the three layers has a different thickness from each other.

Takao discloses [see Fig. 3] an analogous LCD having three color filter layers [R, G, and B], each of which has a different thickness from the others. It would have been obvious to one of ordinary skill in the art to do so in the above device, motivated by *Takao's* teaching that the different thicknesses enable the device to obtain desired spectral characteristics [col. 5, lines 42-45], meaning for instance that the hues of the colors can be adjusted to improve the coloration and the quality of the display. Claim 7 is therefore unpatentable.

The limitation of claim 8, that a thickness of the first color filter is regulated by controlling a coating thickness in a process in which the first color filter is coated on the second substrate or by a slit exposure process, is a product-by-process limitation which does not structurally distinguish the claimed device from that of the prior art [see MPEP 2113]. Claim 8 is therefore unpatentable.

Election/Restrictions

7. Claims 4, 9, and 10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on 4 March 2008 and the reply filed on 6 June 2008.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew Schechter/
Primary Examiner, Art Unit 2883
Technology Center 2800
21 November 2009